

# Induced Seismicity Ground Motion Workshop

February 13-14, 2017

USGS Menlo Park, Rambo Auditorium, Building 3

## Monday, February 13th

8:30-9:00am Registration/coffee

### INTRODUCTION

9:00-9:20 Welcome/Overview **Annemarie Baltay, Eric Thompson (USGS)**

9:20-9:30 Hazard map needs/Current update announcement **Mark Petersen (USGS)**

### DATABASES AND COMPARISONS TO EXISTING MODELS

9:30-10:00 PEER Ground Motion Database for Potentially Induced Earthquakes  
**Yousef Bozorgnia, Tadahiro Kishida (UC Berkeley)**

10:00-10:10 Quick Break

10:10-10:30 Assessing ground motion amplitudes and attenuation for small to moderate induced and tectonic earthquakes in the Central and Eastern United States  
**Abhineet Gupta, Jack Baker (Stanford)**

10:35-10:55 Ground motion database from induced earthquakes in Oklahoma and Kansas and preliminary comparison with GMPEs  
**Morgan Moschetti, Eric Thompson, Steven Rennolet, Dan McNamara, Peter Powers, Susan Hoover (USGS)**

11:00-11:20 Comparison of CEUS GMPEs and recent induced earthquakes in OK  
**Dan McNamara (USGS)**

11:25-11:45 Evaluation of Graizer-Kalkan GMPE for Small-to-Moderate, Shallow Depth Induced Events  
**Erol Kalkan (USGS)**

12:00-1:00 Lunch

### MODEL DEVELOPMENT

1:00-1:20 A Prediction Equation for Ground Motions from Induced Earthquakes in Oklahoma  
**Emrah Yenier (Nanometrics), Gail Atkinson (Western University)**

1:25-1:45 Ground-motion prediction equations for induced events and how they differ from those for natural events  
**Gail Atkinson (Western University), Emrah Yenier (Nanometrics), Karen Assatourians (Western University)**

1:50-2:00 Quick Break

2:00-2:20 Ground Motion Prediction Equation for Small-to-Moderate Earthquake Events in Texas, Oklahoma, and Kansas  
**George Zalachoris, Ellen Rathje (UT Austin)**

2:25-2:45 Stochastic simulation of ground motions from induced earthquakes  
**Taojun Liu (UC Boulder), Nico Luco (USGS), Abbie Liel (UC Boulder), Sanaz Rezaeian (USGS)**

2:50-3:10 Development of a stochastic ground motion prediction model and estimation of stress drops for induced earthquakes in Oklahoma, Kansas, and Texas  
**Ivan Wong (Lettis Consultants), Walter Silva, Bob Darragh (Pacific Engineering and Analysis)**

3:15-5:00 Wrap-up and analysis

5:00 Happy hour at MacArthur Park (27 University Ave, Palo Alto)

## Tuesday, February 14th

- 8:30-9:00 Registration/coffee
- 9:00-9:20 Overview **Annemarie Baltay** (USGS)
- 9:25-9:45 Dependence of Ground Motions of CENA Earthquakes on Hypocentral Depth and Magnitude  
**Art Frankel**, **Tom Hanks** (USGS)
- 9:50-10:10 Earthquake Stress Drop and Source Parameter Scaling in Southern Kansas  
**Daniel Trugman** (UCSD), **Sara Dougherty** (USGS), **Elizabeth Cochran** (USGS), **Peter Shearer** (UCSD)
- 10:15-10:35 Accuracy of stress drop estimation for potentially induced earthquakes in Oklahoma  
**Nana Yoshimitsu**, **Bill Ellsworth**, **Gregory Beroza** (Stanford)
- 10:45-11:45 Posters
- 11:45-12:45 Lunch
- 12:45-1:05 Comparing stress drops of induced and tectonic earthquakes in the central and eastern U.S.  
**Yihe Huang** (U. Michigan), **Bill Ellsworth** (Stanford) and **Greg Beroza** (Stanford)
- 1:10-1:30 Detailed analysis of stress drop variations within individual earthquakes sequences in Oklahoma: implications of earthquake triggering processes  
**Xiaowei Chen** (University of Oklahoma), **Rachel Abercrombie** (Boston University), **Colin Pennington** (University of Oklahoma)
- 1:35-1:55 Stress drop and source scaling for recent earthquake sequences in the central and eastern United States  
**Qimin Wu**, **Martin Chapman** (Virginia Tech)
- 2:00-2:15 Quick break
- 2:15-2:35 Influence of Lithostatic Stress on Earthquake Stress Drops in North America  
**Oliver Boyd**, **Dan McNamara**, **Steve Hartzell**, **George Choy** (USGS)
- 2:40-3:00 Stress drops of the 2011 M5.7 Prague, Oklahoma earthquake sequence  
**Elizabeth Cochran** (USGS), and others
- 3:00-4:30 Discussion

## Posters

- Constraints on Induced Earthquake Intensities from Directly Observed Induced Earthquake Intensities  
**Susan Hough** (USGS)
- Access to "Did You Feel It?" data for induced earthquake studies  
**Vince Quitoriano**, **Eric Thompson**, **Gregory Smoczyk**, **David Wald** (USGS)
- Site Assessment of a New State-Wide Seismic Network in Texas (TexNet)  
**Alexandros Savvaidis** (Texas Seismological Network)
- Site response maps for the OK/KS region  
**Oliver Boyd**, **Eric Thompson** (USGS)
- Vs30 from Multi-Method Site Characterization at Seismograph Locations near Fairview, Oklahoma  
**William Stephenson**, **Dan McNamara**, **Jackson Odum**, **Robert Williams** (USGS)
- Ground Motion Prediction Equation for Western Saudi Arabia  
**Ryota Kiuchi** (USGS/DPRI), **Walter Mooney** (USGS)
- Ground Motions in a Precambrian Shield: Saudi Arabia  
**Walter Mooney** (USGS)

## Review Committee

Tom Hanks, Mark Petersen, Norm Abrahamson, Ruth Harris and Justin Rubinstein